2010-2011 MATHEMATICS Annual Examination

Section-A

Multiple Choice Questions (MCQ's)

Q.1 Choose the correct answer for each from the given option:

(i) {0, 1, 2, 3, ...} is the set of ____________
(a) Prime numbers (b) intigers numbers
(c) Whole numbers (d) Even numbers

(ii) If every element of set A is also an element of the set B then set A is called a ______ of set B.
(a) Power set (b) Equal Set
(c) Equivalent Set (d) Subset

(iii) In scientific notation 0.000573 is written as ____________
(a) 0.0573×10^{-2} (b) 0.573×10^{-4}
(c) 5.73×10^{-4} (d) 57.3×10^{-5}

(iv) $\frac{\log_3 3}{\log_5 2} =$ ________________
(a) $\log_5 2$ (b) $\log_5 3$ (c) $\log_3 2$ (d) $\log_2 3$

(v) The degree of the polynomial $x^2 + xy^2 + y$ is ____________.
(a) 2 (b) 3 (c) 4 (d) 1

(vi) $(\sqrt{x} + \sqrt{y})(\sqrt{x} - \sqrt{y}) =$ ________________.
(a) $(\sqrt{x} + \sqrt{y})^2$ (b) $(\sqrt{x} - \sqrt{y})^2$
(c) $(\sqrt{x} - \sqrt{y})$ (d) $(x - y)$

(vii) The L.C.M of $x^3 - y^3$ and $x^6 - y^6$ is ________________.
(a) $x^3 - y^3$ (b) $x^3 + y^3$
(c) $x^6 + y^6$ (d) $x^6 - y^6$

(viii) In a right angled triangle the side opposite to right angle is called ______.
(a) Perpendicular (b) Hypotenuse (c) Altitude (d) None of these

(ix) If (x-2) (x+3) = 0, then x = ________________
(a) -2, -3 (b) 2, 3 (c) 2, -3 (d) -2, 3

(x) |-5|, absolute value of -5 is ____________.
(a) -5 (b) ∓5 (c) ± 5 (d) -(-5)

(xi) In 12, 13, 4, 4, 5, 7, 9 the mode is ____________.
(a) 3 (b) 5.5 (c) 4 (d) 9

(xii) A series contains values 15, 19, 13, 11, 14, 16 its median is ________
(a) 12 (b) 13 (c) 14 (d) 14.5

(xiii) The point through which bisectors of angles of a triangle pass is called ________.
(a) incentre (b) Orhtocentre (c) Cenotoroid (d) None of these

(xiv) $\begin{bmatrix} 4 & 0 \\ 0 & 4 \end{bmatrix}$ is a ____________ matrix.
(a) Rectangular (b) Unit (c) Scalar (d) Diagonal

(xv) The value of Sin 30° is ____________.
(a) 2 (b) $\frac{1}{2}$ (c) -2 (d) $\frac{1}{\sqrt{2}}$

(xvi) The value of cot 60° is ____________.
(a) $\frac{\sqrt{3}}{2}$ (b) $\frac{2}{\sqrt{3}}$ (c) $\frac{1}{\sqrt{3}}$ (d) $\sqrt{3}$

(xvii) $1 + \tan^2 45^\circ = \sec^2$ ____________.
(a) 30° (b) 90° (c) 60° (d) 45°

(xviii) $\frac{a^7}{a^3} =$ ____________.
(a) a^4 (b) a^{10} (c) a^{21} (d) None of these

(xix) The polynomial expression $x^2 + 7x + 3$ w.r.t the terms is called ______.
(a) Binomial (b) Trinomial (c Monomial (d) None of these

(xx) The characteristic of log 5.723 is ________________.
(a) 1 (b) -1 (c) 0 (d) 2

Section-B (Short Answers)

Note: Attempt any TEN questions from the following. Each question carries 5 marks.

Q.2 If A = { a, b }, B = { 2, 3 } and C = { 3, 4 } Find the value of .
(i) $A \times (B \cap C)$ (ii) $A \times (B \cup C)$

Q.3 Simplify
(i) $\frac{-20(2p - 3q)^{12}(4 - 3r)^3}{-4(2p - 3q)^9(4 - 3r)}$ (ii) $\sqrt[4]{625}$

Q.4 Find the value of $x^2 + \frac{1}{x^2}$, when $x = 2 + \sqrt{3}$

Q.5 Simplify with the help of logarithms $\frac{57.26}{\sqrt[3]{0.382}}$

Q.6 Find the value of $a^2 + b^2$ when $a + b = 4$, $ab = 3$

Q.7 For what value of "a" will $9x^3 - 6x^2 + 3x - a$ be exactly divisible by $x^2 - 2x + 3$?

Q.8 Factorize any TWO of the following:
(a) $a^8 + a^4 + 1$ (b) $x^3 - x - 2y + 8y^3$ (c) $x^{12} - y^{12}$

Q.9 Find the square root of $a^4 + 10a^3 + 31a^2 + 30a + 9$

Q.10 If $A = \begin{bmatrix} 1 & 3 \\ 2 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 5 \\ 3 & 0 \end{bmatrix}$ then proved that $AB \neq BA$

Q.11 Define any TWO of the following and draw the figures.
(i) Line Segment (ii) Opposite Rays (iii) Adjacent Angles

Q.12 Take triangle PQR and draw its medians.

Q.13 Find the solution set of any ONE of the following equations.
(i) $\frac{\sqrt{4y + 2} + 13}{6} = 2$ (ii) $|3x - 4| = 22$

Q.14 Define Median and gives its merits and demerits.

OR

Two numbers are in the ratio 7.8 and sum is 105. Find the number.

Q.15 Prove that : $\frac{\sin\theta}{1 - \cos\theta} = \frac{1 + \cos\theta}{\sin\theta}$

Section-C (Descriptive)

Note: Answer any THREE of the following questions in detail. Each question carries 10 marks.

Q.16 (a) Solve triangle ABC when $m\angle C = 90^\circ$, $m\angle A = 45^\circ$ and $a = 10cm$
(b) A pole 14m high on the bank of the stream makes an angle of 30° with a place on the opposite bank. Find the breadth of the stream.

Q.17 (a) Eliminate "x" from the equations $x - \frac{1}{x} = 2a$, $x^2 + \frac{1}{x^2} = b^2$
(b) Find the factor of $x^3 - 7x + 6$ by using Reminder theorem.

Q.18 (a If two lines intersect, then the vertical angles are congruent. Prove it.
(b) If two angles of a traingle anre conguruent the sides opposite to them are also congruent. Prove it.

Q.19 (a) The sum of the measure of the angles of a triangle is 180° Prove it.
(b) The measures fo the angles of a triangle are in the ratio 3 : 4 : 5. State the type of the triangle.

Q.20 (a) If a perpendicular is drawn from the centre to a chord of a cirlce. it bisects the chord. Provt it.
(b) In a circle of radius 5cm, a chord measuring 8 cm has been drawn. find its distance from the centre of the circle.